Appendix A

Demographic Trends

Population trends in Cambridge are similar to those found in other major urban centers within the (MSA). According to the 2000 Census, the population of Eastern Cambridge has shown a gradual increase, similar to the rest of the City, though at a slightly higher rate. The population data is summarized in the table below.

The number of households in Eastern Cambridge has increased at a rate significantly higher than the city as a whole. At the same time, average household size in Eastern Cambridge has declined, dropping from 2.54 in 1980 to 2.24 in 1990. This remains higher than the Cambridge citywide average of 2.03. In spite of the area's proximity to MIT, students comprise a relatively small fraction of the resident population. According to the 1990 Census group-quartered individuals made up only 2% of the Eastern Cambridge population, compared to 15% citywide.

YEAR	POPULATION		HOUSEHOLDS	
	Cambridge	Eastern Cambridge	Cambridge	Eastern Cambridge
1980	95,322	17,518	38,836	6,779
1990	95,802	17,826	39,405	7,259
2000	101,355	19,990	42,615	8,758

Appendix B

Anticipated Development Under Proposed Zoning

Following is a summary of the 20-year build out projections for North Point, Volpe and the Transition Areas. These figures are based on projected market trends for commercial and residential uses, as well as site-specific development opportunities and constraints.

NORTH POINT

ASSUMPTIONS:

- Buildable area = 2,062,971 sq. ft.
- 55% of full build out will be achieved in 20 years
- FAR = 2.5 plus inclusionary bonus for affordable housing
- Commercial development = 35% of total development

NEW DEVELOPMENT

Housing
2,694,800 sq. ft.
2,160 units (at 1250 sq. ft. per unit)
3,240 parking spaces (at 1.5 spaces per unit)
General Office
496,400 sq. ft.
790 parking spaces (at 1 space per 625 SF)
R&D
496,400 sq. ft.
590 parking spaces (at 1 space per 840 SF)

NEW RESIDENTIAL POPULATION
4380 persons (average 2.03 persons per household)1

VOLPE CENTER AREA

ASSUMPTIONS:

- Buildable area = 835,000 SF
- 90% of full build out will be achieved in 20 years
- FAR = 2.5 plus inclusionary bonus for affordable housing
- Net new commercial development (at full build out) = 750,000 sq. ft.

NEW DEVELOPMENT

Housing
1,872,500 sq. ft.
1,500 units (at 1250 square feet per unit)
2,250 parking spaces (at 1.5 spaces per unit)
General Office
337,500 sq. ft.
540 parking spaces (at 1 space per 625 SF)
R&D
337,500 sq. ft.
400 parking spaces (at 1 space per 840 SF)

New Residential Population
3,045 persons (average 2.03 persons per household)

TRANSITION AREAS

ASSUMPTIONS:

- Approximately twenty percent of all properties in Transition Area A are likely to redevelop in twenty years.
- Significant redevelopment is not likely to occur in Transition Area B.
- For properties likely to redevelop, 62% of full build out will be achieved in 20 years.
- Residential FAR = 2.5 plus inclusionary bonus for affordable housing
- Commercial FAR = 1.25
- New development will be predominantly residential.

NEW DEVELOPMENT

Housing
950,000 sq. ft.
760 units (at 1250 sq. ft. per unit)
1140 parking spaces (at 1.5 spaces per unit)
General Office
56,700 sq. ft.
90 parking spaces
R&D
56,700 sq. ft.
70 parking spaces
Redevelopment of existing properties in the Transition Area will likely result in a net loss of existing industrial and retail space, as shown below:
Industrial: -229,100 sq. ft.
Retail: -29,400 sq. ft.

NEW RESIDENTIAL POPULATION

1,540 persons (average 2.03 persons per household)

** Based on projected average household size for Eastern Cambridge in 2005.*

Appendix C

Retail Stores, Employment & Sales in the Cambridge Market

	CAMBRIDGE TOTAL			EASTERN CAMBRIDGE		
Category	Stores	Employees	Annual Sales ($M)	Stores	Employees	Annual Sales ($M)
General Merchandise	16	491	53.30	6	402	44.50
Apparel/Accessories	127	1,218	87.30	51	651	49.50
Radio/TV/Computers	198	3,980	1,070.90	65	1,996	549.20
Household Appliances	7	27	4.80	1	1	$0.20
Eating/Drinking	347	6,165	300.80	92	1,475	71.20
Misc. Convenience Goods	82	474	67.50	22	100	14.20
Furniture/Furnishings	80	450	57.20	19	102	11.50
Material/Garden	32	378	54.70	5	78	10.80
Misc. Shopping Goods	139	1,369	99.00	30	258	18.50
Drugs Stores	14	190	24.50	2	35	4.50
Other	36	328	33.00	8	45	4.50
Auto Sales/Services	44	311	82.60	9	54	10.10
Food	110	1,545	217.00	28	124	10.20
Liquor Stores	17	113	8.80	1	2	0.20
Total	1251	17,039	2,161.40	339	5,323	798.90

Appendix D

Eastern Cambridge Design Guidelines

The Eastern Cambridge Design Guidelines were developed as part of the Eastern Cambridge Planning Study. The guidelines are intended to inform property owners, business owners, developers, and the general public about the desired form and character of development in the ECaPS Study Area. They will guide development activities in this area, particularly in North Point, the Volpe site, the transition areas between residential neighborhoods and Kendall Square, as well as other areas in Wellington-Harrington, Area IV, and East Cambridge. The aim is to create consistently high-quality public environments, and to ensure that development contributes to the character and vitality of the surrounding community. The guidelines are based on the following core principles:

- Manage development to maintain livability in residential neighborhoods and ensure compatibility with existing neighborhood character.
- Provide better transitions between developed/developing areas and residential neighborhoods.
- Create new mixed-use neighborhoods at North Point and the Volpe Center that are integrated with the existing urban fabric.
- Enhance quality of life through the creation of active streets, new public open spaces, and expanded retail opportunities.
- Strengthen pedestrian and bicycle connections throughout Eastern Cambridge, especially between residential neighborhoods and Kendall Square, the Lechmere transit station, and the Charles River.

The Eastern Cambridge Design Guidelines will be referenced by the Planning Board in their review of special permit applications for projects in the ECaPS Study Area that are before the Board. These guidelines will be specifically referenced in the City's zoning ordinance in the Project Review Special Permit section and in the PUD text where applicable. Therefore, they will serve as a guide to developers for projects in the Eastern Cambridge study area that seek a PUD special permit or a Project Review special permit, among other discretionary permits.

The guidelines are organized into two sections: Built Form, which addresses the use, scale, and character of buildings; and Public Realm, which addresses connections, streets and sidewalks, open space, and transportation. Where additional area-specific guidelines are proposed, they are listed at the end of the appropriate section. The areas are the focus areas as defined for ECaPS.

A. Goals

This section lists the goals that guided the development of these guidelines.

NORTH POINT

- Create a lively new mixed-use district with strong visual and pedestrian connections to East Cambridge. The new district should be a place to live, work, and enjoy a variety of parks and public spaces.
- Create a new east-west main street through the center of North Point, connecting East Cambridge with the future MDC Park
- Extend First Street into North Point to connect existing and new neighborhoods.
- Create a major new public park easily accessible from the relocated Lechmere T station, First Street, and O'Brien Highway.
- Create a new retail edge at the relocated Lechmere T station and at the intersection of First Street, Cambridge Street, and O'Brien Highway that will complement, not compete with, existing retail on Cambridge Street.

VOLPE CENTER AREA

- Create new housing south of Binney Street to link existing neighborhoods and Kendall Square.
- Create a major new public park facing Binney Street, surrounded by residential and retail uses.
- Strongly encourage retail on Third Street and Broadway to create active street life in Kendall Square and to create a lively connection between the neighborhoods and Kendall Square.
- Create a mix of housing and commercial uses along Broadway.
- Create a transition in land uses and heights from Broadway to the residential neighborhoods.

TRANSITION AREAS

- Encourage new residential development and conversions of existing buildings to residential use but allow existing commercial uses to remain.
- Use finely graduated heights to create transitions in scale from Kendall Square to residential neighborhoods.
- Create better pedestrian and bicycle connections between residential neighborhoods, Kendall Square, Central Square, and the Charles River.

NEIGHBORHOODS

- Preserve and enhance neighborhood character.
- Maintain the walkable scale and character of residential blocks.
- Support and strengthen businesses on Cambridge Street, Broadway, and Main Street.

B. Built Form

1. STREET-LEVEL USES AND DESIGN

The following guidelines apply primarily to large-scale development sites. For these larger sites, developers should clearly identify the intended use and size for each block. For infill development, new buildings should contribute to the character of the existing street.

a. Residential blocks are blocks that are primarily lined with housing. Corner retail is allowed and even encouraged in some of these blocks, depending on the zoning.

New development on residential blocks should be consistent with the following principles:

i. Create a consistent residential edge, with small setbacks for stoops, porches, and front gardens.

ii. Buildings should be designed with individual units and front doors facing the street, including row house units on the lower levels of multi-family buildings. Where residential lobbies face the street, doors should generally be spaced no more than 75 feet apart.

iii. Blank walls should be avoided along all streets and pedestrian walkways.

b. Mixed-use blocks are blocks that include housing and/or commercial uses, with a mix of active uses strongly encouraged on the ground floor.

New development on mixed-use blocks should be consistent with the following principles:

i. Street-level facades should include active uses such as:

- Residential entrances
- Shops, restaurants, and cafes
- Services for the public or for commercial offices such as fitness centers, cafeterias, daycare centers, etc.
- Community spaces, such as exhibition or meeting space
- Art exhibition space/display windows
- Commercial lobbies and front doors

ii. Office/ R&D uses are discouraged from occupying extensive ground-floor frontage. Where these uses do occur, they should occupy no more than 200 to 250 feet of continuous frontage along public streets.

iii. Major entrances should be located on public streets, and at or near corners wherever possible. Entrances should relate well to crosswalks and pathways that lead to bus stops and transit stations.

iv. Transparent materials and interior lighting should be used to maximize visibility of street level uses. Ground floor facades should be at least 30 to 50 percent transparent surface to permit a clear view from the sidewalk to the interior space of the building.

v. Blank walls should be avoided along all streets and pedestrian walkways.

c. Retail blocks are blocks that include both commercial and residential uses on upper floors, with retail strongly encouraged on the ground floor. Retail blocks are intended to have a high volume of pedestrian traffic, and to support public activity throughout the day and evening.

New development on retail blocks should be consistent with the following principles:

i. At least 75 percent of the street frontage should be occupied by retail uses, including cafes and restaurants.

ii. Major entrances should be located on public streets, and on corners wherever possible. Entrances should relate to crosswalks and pathways that lead to bus stops and transit stations.

iii. Transparent materials and interior lighting should be used to maximize visibility of street level uses. Ground floor facades should be at least 50 to 75 percent transparent surface to permit a clear view from the sidewalk to the interior space of the building.

iv. Blank walls should be avoided along all streets and pedestrian walkways.

2. BUILDING HEIGHT AND ORIENTATION

a. Major public streets

These include a new main street at North Point; O'Brien Highway; Cambridge Street; Broadway; Binney Street; Third Street between Broadway and Binney; First Street (including the extension into North Point), and Main Street.

i. Set back any portion of the building above 65 feet by at least 10 feet from the principal facade.

ii. For retail and office uses, build to the lot line or provide small setbacks (5 to 15 feet) from the right-of-way for café seating, benches, or small open spaces. Setbacks used exclusively for ornamental landscaping are not permitted but may be allowed to accommodate street furniture, street trees, or generous sidewalks. Awnings and canopies are encouraged to provide shelter and enliven the ground floor facade.

iii. For residential uses, provide small setbacks (5 to 10 feet) for stoops, porches, and front gardens.

iv. Driveway turnaround and vehicle drop-off facilities are strongly discouraged along public streets.

v. Locate loading docks on side streets or service alleys, and away from residential areas.

vi. In use, design, and entry, orient buildings towards corners.

b. Neighborhood Streets

These include existing residential streets in East Cambridge, Wellington / Harrington, Area IV, and the Transition Area, as well as new residential streets at North Point and the Volpe Center.

i. Set back any portion of the building above 45 feet by at least 10 feet from the principal facade. Where appropriate, design these setbacks to include balconies and rooftop terraces.

ii. For residential uses, provide small setbacks (5 to 15 feet) for stoops, porches, and front gardens.

iii. Provide individual entrances to ground floor units along the street.

iv. Locate courtyards and open spaces to maximize sun exposure.

c. Park Edges

These are streets facing a public park.

i. The height of the principal façade of buildings surrounding a park should be no greater than 1/3 the width of the park. For additional height above this limit, buildings should be stepped back by at least ten feet from the principal facade. Greater height without setbacks may, however, be appropriate at corners or in specific locations to create architectural variety. The buildings must conform to overall district height limits in the zoning.

ii. Locate buildings to minimize shadows on the park, especially in the afternoon.

iii. Surround public parks with uses that create an active environment throughout the day and evening and increase safety for park users, such as:

- Buildings should be designed with individual units and front doors facing the street, including row house units on the lower levels of multi-family buildings. Where residential lobbies face the street, doors should generally be spaced no more than 75 feet apart.
- Shops, cafés and other public uses that enliven the street.

d. Other Streets

i. If the prevailing height of surrounding buildings is 65 feet or less, establish a cornice line that matches the prevailing height of surrounding buildings. For additional height above the cornice line, provide a setback of at least 10 feet from the principal façade.

ii. For retail and office uses, build to the lot line or provide small setbacks (5 to 15 feet) from the right-of-way for café seating, benches, or small open spaces. Setbacks used exclusively for ornamental landscaping are not permitted.

iii. For residential uses, provide small setbacks (5 to 10 feet) for stoops, porches, and front gardens.

iv. Locate loading docks on side streets or service alleys, and away from residential areas.

3. SCALE AND MASSING

a. For new development sites, the block size should be similar to the existing East Cambridge blocks. An attempt should be made to reduce the distance that pedestrians have to walk to a crosswalk in order to safely cross the street.

b. Buildings should avoid continuous massing longer than 100 feet facing residential streets and 200 feet facing mixed-use and retail streets. If massing extends beyond this length, it should be made permeable and visibly articulated as several smaller masses using different materials or colors, vertical breaks, bays, or other architectural elements.

c. In addition to the above limits, buildings should reflect a rhythm and variation appropriate to the urban context. For example, this can be achieved by expressing bay widths of 16 to 25 feet along residential streets and 25 to 50 feet along mixed-use and retail streets.

d. Buildings should have a clearly expressed base, middle, and top. This may be achieved through changes in material, fenestration, architectural detailing, or other elements.

e. Use variations in height and architectural elements such as parapets, cornices and other details to create interesting and varied rooflines and to clearly express the tops of buildings.

f. Emphasize corners using taller elements such as towers, turrets, and bays

g. Taller buildings should be articulated to avoid a monolithic appearance. Preference is given to point towers over slabs, and to buildings with smaller floor plates.

4. ARCHITECTURAL CHARACTER

a. Residential

i. Create varied architecture and avoid flat facades by using bays, balconies, porches, stoops, and other projecting elements.

ii. Maximize the number of windows facing public streets to increase safety.

b. Commercial

i. Create varied architecture and avoid flat facades by using recessed or projected entryways, bays, canopies, awnings, and other architectural elements.

ii. Vary the architecture of individual buildings to create architecturally diverse districts.

iii. Where buildings are set back at upper stories, lower roofs may be used as balconies, balustrades, and gardens.

5. ENVIRONMENTAL GUIDELINES

a. Design buildings to use natural resources and energy resources efficiently in construction, maintenance, and long-term operation of the building. Buildings on a lot should be sited to allow construction on adjacent lots to do the same. Compliance with Leadership in Energy and Environmental Design (LEED) certification standards and other evolving environmental efficiency standards is encouraged.

b. Rooftop mechanical equipment should be sited and shielded to protect neighboring uses from noise impacts.

6. PARKING

a. While underground parking is preferable everywhere, if above ground parking is to be built it should be designed so as not to be visible from public streets or pathways. Above ground structured parking should be lined with active uses (shops, cafes, etc.) along major public streets, or with housing units along residential streets.

b. Locate vehicular parking entrances on side streets and alleys and provide safe pedestrian access from public streets.

c. All parking garages must provide direct pedestrian access to the street.

d. The primary pedestrian exit/access to all garages serving non-residential uses should be to the street or a public area.

e. Design and locate lighting fixtures in surface parking lots and garages to enhance safety while minimizing light spillover onto adjacent properties.

C. Public Realm

1. OPEN SPACE

a. Public open space

i. The provision of open space of diverse sizes and use is encouraged to enhance the public environment in the study area.

ii. The provision of interconnected series of open spaces is encouraged to provide connections to neighborhoods and to encourage pedestrian movement.

iii. Where major new parks are required by zoning, provide programmed, multi-use open space for both recreational and cultural activities.

Area-specific guidelines:

North Point

- The major new park required by the zoning code should be located convenient to the Lechmere T station in order to link East Cambridge and future neighborhoods at North Point.
- In addition to the required public open space, the creation of a series of smaller open spaces such as courtyards, parks, playgrounds and gardens located along the central main street is encouraged.

Volpe Center

- Use open space to create links between Kendall Square and the residential neighborhoods.

Transition Areas and Neighborhoods

Locate new open spaces to create linkages and connect to existing parks and open spaces, where possible.

b. Semi-private open space

i. For residential development, create semi-private open spaces (e.g. front and rear yards, porches, stoops, and patios) that create a transition from public sidewalks and courts to private interior spaces.

ii. Design residential courtyards to be visually accessible from streets to enhance safety and activity along the street.

2. STREETS AND SIDEWALKS

a. Character

i. Use streetscape elements such as trees, benches, signage, and lighting to support active pedestrian uses and to reinforce the character and identity of each district.

ii. Design streets to encourage pedestrian and cycle activity, and to control vehicle speed in residential areas.

b. Where appropriate, establish, preserve and highlight views from public streets and spaces to important civic landmarks such as the Charles River cable-stayed bridge and the clock tower in Kendall Square.

c. In the design of new streets, provide sufficient pavement width to accommodate on-street parking where appropriate in order to provide short-term parking and to serve local retail.

d. In the design of new streets, pathways, and parks, provide pedestrian-scale lighting to enhance pedestrian safety.

e. Refer to the Cambridge Pedestrian Plan and the Cambridge Bicycle Plan for additional guidance on creating a safe and pleasant environment for pedestrians and bicyclists and for guidance on sidewalk width and street trees.

3. CONNECTIONS

a. Provide safe pedestrian and bicycle connections to future regional pathways (Grand Junction railroad, North Point path).

b. Provide strong pedestrian, bicycle and visual connections to the Charles River and public parks through view corridors, signage, and/or art installations.

c. Provide safe pedestrian and bicycle connections to existing and new bus stops and to transit stations including Kendall Square, Lechmere, Community College and North Station MBTA stations.

Area-specific guidelines:

North Point

- Provide continuous pedestrian and bicycle access through the area to the MDC New Charles River Basin Park.

- Provide new pedestrian crossings along O'Brien Highway with strong visual connections from existing streets in East Cambridge to new streets at North Point. Ensure that new pedestrian crossings are coordinated with traffic operations on O'Brien Highway.
- Provide an attractive landscaped edge between the future Somerville regional bicycle path and the adjacent rail yards.
- Provide landscaped pedestrian / cycle connections from North Point to the future regional bicycle path.

Volpe Center

- Provide green connections to Broadway and Third Street as extensions of the proposed public park.
- Provide strong pedestrian and bicycle connections to the Broad Canal and the Charles River from the site.

Transition Areas

- Provide safe pedestrian crossings at Binney Street.
- Design the new park on Fulkerson Street to maximize visual connections between neighborhoods on either side of the Grand Junction rail tracks.

Neighborhoods

- Improve pedestrian, and bicycle connections to the Charles River, particularly across First Street.
- Improve visual, pedestrian, and bicycle connections between the residential neighborhoods on either side of the Grand Junction rail tracks.

4. TRANSPORTATION

a. Transit

i. Preserve rights of way for future Urban Ring project.

ii. Integrate retail and other public activities with any new transit stations.

b. Pedestrian

i. Provide pedestrian crossings / phases at all major intersections.

c. Bicycle / other non-motorized vehicles

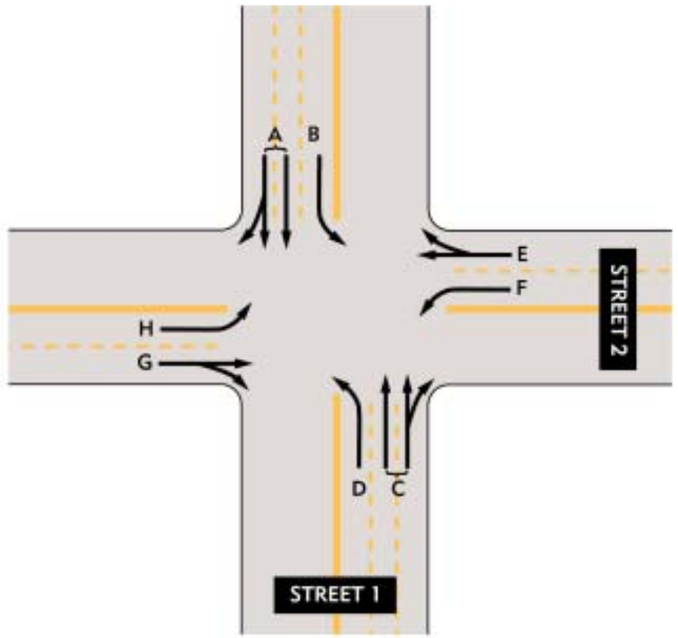
i. Provide bicycle lanes on major streets.

ii. Provide sheltered bicycle racks in all new commercial and multi-family residential buildings and in transit stations.

iii. Provide bicycle racks along the street in retail areas.

Appendix E

Critical Movements Analysis

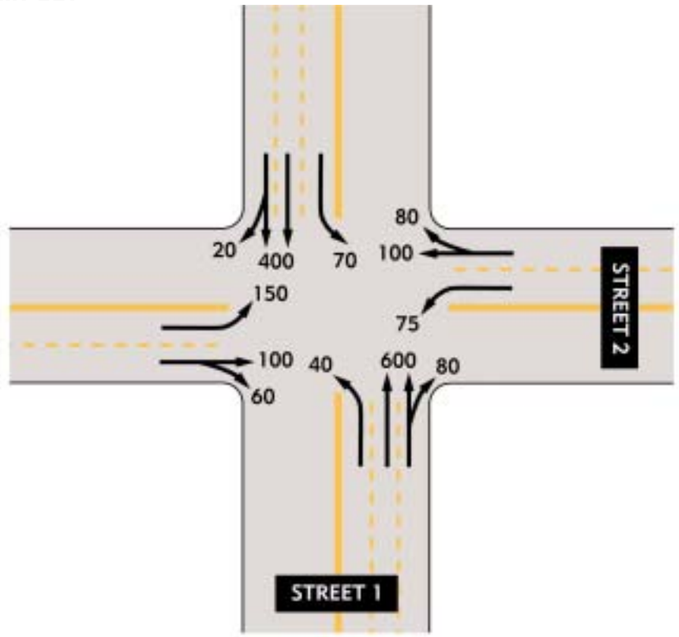


Street 1: (A ÷ 2) + D *or* (C ÷ 2) + B, whichever is more

Street 2: E + H *or* G + F, whichever is more

Critical Sum = Result of Street 1 + Street 2

EXAMPLE:



Street 1: [(400 + 20)/2] + 40 = 250 *or* [(600 + 80)/2] + 70 = 410

Street 2: (100 + 80) + 150 = 330 *or* (100 + 60) + 75 = 235

Critical Sum = 410 + 330 = 740 vehicles

		1998		2005		2020		2020 Buildout							
		Existing		Permitted Condition		Permitted Condition		Status Quo		Citywide Proposal		Initial Land use Scenario		Initial Land use Scenario with Auto Trip Reduction	
Intersection		Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum	Turning Movements	Critical Sum
1	Main Street / Windsor Street	No data	No data	140	50	140	50	310	110	300	90	280	90	250	80
2	Main Street/ Portland Street	1,390	750	1,600	870	1,710	930	1,870	1,010	1,850	970	1,840	970	1,810	960
3	Main Street/ Albany	870	610	1,050	710	1,120	760	1,360	950	1,350	930	1,310	910	1,280	880
4	Main Street /Vassar Street	1,610	580	2,220	830	2,350	880	2,870	1,170	2,750	1,130	2,680	1,090	2,620	1,050
5	Main Street/ Ames Street/Mid-block Connector	1,110	490	1,480	670	1,570	710	1,570	710	1,570	710	1,570	710	1,570	710
6	Wadsworth Street / Memorial Drive	1,270	700	1,320	720	1,420	780	1,470	790	1,460	780	1,470	780	1,460	780
7	Broadway/Third Street	2,280	1,110	2,850	1,340	3,030	1,430	3,350	1,710	3,200	1,570	3,160	1,530	3,130	1,510
8	Broadway Avenue/ Ames Street	1,620	660	2,120	940	2,250	1,000	2,310	1,000	2,320	1,000	2,330	1,000	2,310	1,000
9	Broadway Avenue/ Galilei Street	2,800	1,020	3,600	1,330	3,830	1,420	4,880	1,850	4,610	1,790	4,460	1,730	4,330	1,670
10	Broadway Avenue/ Hampshire Street	1,760	780	2,290	990	2,430	1,050	2,960	1,360	2,860	1,290	2,770	1,240	2,700	1,200
11	Broadway Avenue/ Portland Street	1,380	680	1,720	820	1,840	870	1,970	930	2,000	940	1,990	940	1,960	920
12	Broadway Avenue/ Windsor Street	1,330	840	1,470	950	1,580	1,010	1,880	1,210	1,810	1,110	1,770	1,090	1,730	1,070
13	Hampshire Street/ Card. Madeiros	1,620	950	1,840	1,090	1,970	1,170	2,200	1,360	2,160	1,300	2,120	1,260	2,090	1,250
14	Hampshire Street/ Windsor	No data	No data	160	100	160	120	390	290	340	220	310	190	280	170
15	Little Binney/ Card. Madeiros	1,020	780	1,130	850	1,220	920	1,230	930	1,240	940	1,240	940	1,230	930
16	Little Binney/ Kendall Square Garage Driveway	610	380	820	510	870	540	870	540	870	540	870	540	870	540
17	Binney Street/ Fulkerson Street	690	690	940	940	1,000	1,000	1,320	1,320	1,380	1,380	1,340	1,340	1,270	1,270
18	Little Binney/ Fulkerson Street	720	570	780	620	840	670	840	670	840	670	840	670	840	670
19	Little Binney/ Binney Street	360	360	480	480	510	510	700	700	690	690	670	670	640	640
20	Munroe Street/Third Street	1,330	970	1,570	1,170	1,680	1,240	1,960	1,500	1,830	1,360	1,800	1,330	1,770	1,310
21	Binney Street/ Land Boulevard	3,150	1,080	3,960	1,710	4,210	1,790	5,010	2,370	4,670	2,130	4,610	2,060	4,540	2,010
22	Binney Street/ First Street	1,820	820	2,610	1,030	2,760	1,100	3,660	1,300	3,390	1,350	3,220	1,300	3,130	1,260
23	Binney Street/ Second Street	1,280	470	1,930	780	2,030	820	2,890	1,150	2,680	1,040	2,530	970	2,440	940
24	Binney Street /Third Street	2,280	1,200	2,960	1,420	3,150	1,520	4,500	1,960	4,080	1,810	3,880	1,740	3,740	1,690
25	Charles Street/ Land Blvd.	3,320	1,190	3,860	1,420	4,130	1,510	4,920	1,730	4,650	1,670	4,570	1,630	4,490	1,610
26	Charles Street/ First Street	1,330	550	1,490	630	1,590	670	1,760	710	1,880	750	1,820	730	1,770	720
27	Charles Street/ Third Street	No data	No data	190	130	190	130	560	390	430	250	390	220	350	200
28	Charles Street/ Sixth Street	610	400	740	470	790	500	790	500	790	500	790	500	790	500
29	Cambridge Street/ Windsor	No data	No data	20	10	20	10	300	230	190	130	210	140	170	120
30	Cambridge Street/Cardinal Madeiros/Warren Street	1,800	1,080	1,980	1,190	2,120	1,280	2,440	1,540	2,370	1,440	2,370	1,450	2,320	1,420
31	Cambridge Street/Lambert/Fulkerson	1,320	880	1,400	940	1,510	1,010	1,820	1,100	1,760	1,130	1,750	1,110	1,710	1,090
32	Cambridge Street/Sixth Street	1,180	520	1,280	580	1,380	630	1,690	740	1,620	690	1,620	700	1,580	680
33	Cambridge Street/Third Street	1,860	920	2,130	1,060	2,280	1,140	2,970	1,300	2,740	1,230	2,700	1,230	2,620	1,210
34	Cambridge Street/Second Street	1,190	820	1,280	890	1,380	960	1,690	1,040	1,610	1,060	1,600	1,040	1,560	1,020
35	Cambridge Street/First Street	1,670	1,120	1,850	1,280	1,990	1,370	2,480	1,580	2,510	1,700	2,430	1,630	2,350	1,580
36	McGrath O'Brien Highway/ Cambridge Street	3,580	1,040	3,850	1,110	4,130	1,190	5,410	1,780	5,090	1,590	4,980	1,590	4,830	1,520
37	McGrath O'Brien Highway/ Land Boulevard	5,180	1,600	6,060	1,810	6,470	1,940	7,540	2,210	7,160	2,100	7,090	2,080	6,980	2,060
38	McGrath O'Brien Highway/ Third Street	3,270	1,350	3,640	1,510	3,900	1,620	4,010	1,670	4,020	1,670	4,010	1,670	3,990	1,660
39	Gore Street/Warren Street	1,340	860	1,410	910	1,520	980	1,520	980	1,520	980	1,520	980	1,520	980

Total Critical Sum above 1500 threshold	100	530	880	3,410	2,530	0	2,170	0	1,800
Total Critical Sum above 1500 threshold for NEW Development	N/A	N/A	N/A	2,530	1,650		1,290		920

Auto Trips Generated for NEW Development	N/A	N/A	N/A	4,040	2,600		2,270		1,840

Appendix F

Transportation Recommendations

The following is a list of recommendations that were articulated during the ECaPS process and is intended to guide City priorities and mitigation requirements for projects that require special permits. Such improvements would occur over a long period of time and as such, the recommendations should be reevaluated at the time of implementation to ensure that they are the appropriate measures to achieve the desired goals.

Objective	Strategy	Recommendations
A. REDUCE NEW AUTO TRIPS		
Achieve a **reduction in auto trip generation** consistent with the City-wide objective to reduce new auto-trip generation by 50%.	Incorporate zoning constraints on parking supply for new development.	**1.** Reduce maximum parking ratios for commercial development by 20% from those proposed under Citywide Growth Management in North Point.
		2. Establish a maximum parking ratio for residential development of 1.5 spaces per unit.
		3. Establish a non-residential parking "cap" of 2,500 spaces in North Point, consistent with zoning as now proposed under the EcaPS recommendations.
	Implement demand management measures or infrastructure projects that support alternatives to driving.	4. Require new development to support the reduced auto mode-share reflected in the constrained parking supply with a package of measures additional to the level of TDM already required by the City under PTDM initiatives. Examples of measures that might be considered include the following: (a) Travel Demand Management Initiatives such as: • car sharing organization membership for residents and/or employees to reduce individual car ownership and use • set-aside of parking spaces for car-sharing vehicles • provision of T-pass for households to encourage transit use • residential membership of TMA, with coordinator to enable TMA benefits such as vanpool programs to extend to residential projects

Objective	Strategy	Recommendations
		extend to residential projects • option of residential parking leasing versus mandatory ownership to discourage car ownership • graduated parking rates (increased rate for multiple car/space) to discourage multiple car ownership • shuttle service, including residential-to-transit connections to provide attractive alternative to single occupancy vehicle auto travel • allocation of space for transportation information center to promote/encourage non-auto modes • bicycle fleet and support facilities available to residents or employees • allocation of space for daycare facilities to reduce vehicle trips associated with child care drop-off; state-of-the-art public transit stops (e.g. shelters, seats, information etc.) (b) Infrastructure Projects to enhance non-auto mobility such as: • relocation of Lechmere station; North Point pedestrian/bicycle connection to Bunker Hill Community College station • pedestrian crossings of Monsignor O'Brien Highway • additional or upgraded pedestrian crossing of Binney Street, First Street, Land Boulevard and Memorial Drive • off-road bicycle/pedestrian path through North Point • off-road bicycle/pedestrian path segment on Grand Junction (the City is currently conducting a feasibility study) • bicycle station (locker facilities, showers, repair shop etc.) • North Point busway connection to Bunker Hill Community College station • Green Line extension beyond Lechmere • Lechmere station bus facility • Urban Ring components including right of way protection • Third Street/Main Street bus link and associated bicycle connections

Objective	Strategy	Recommendations
B. INFLUENCING WHERE TRAFFIC GOES		
Encourage **use of the First Street corridor** as the preferred north-south route to Kendall Square, complementary to Land Boulevard.	Enhance connection of First Street to Monsignor O'Brien Highway.	**5.** Plan for the future extension of First Street to Monsignor O'Brien Highway in conjunction with the relocation of Lechmere station.
	Facilitate two-way connection between Linskey Way and First Street	**6.** Alter circulation on Linskey Way to provide for two-way travel between First Street and the Beal garage driveway on Linskey Way.
Enhance **access to new development at North Point** while minimizing traffic impacts on residential neighborhoods.	Optimize access connections to North Point by "intercepting" traffic at the earliest opportunities on Monsignor O'Brien Highway, incorporating improved pedestrian and bicycle connections. Improvements along Monsignor O'Brien Highway are under the jurisdiction of the Metropolitan district Commission (MDC) and will require their approval.)	Recommendations for access to North Point: **7.** *Third Street* - Eliminate westbound left turn from Monsignor O'Brien Highway to Third Street. - Provide widened median by elimination of westbound left turn. - Improve protection for existing crosswalk by elimination of northbound "turn-on-red." - Provide improvements including curb extension on western corner to shorten Third Street crosswalk and reduce corner radius (to slow turning vehicles), and eliminate "turn on red" provisions.
		8. *Water Street:* • Provide signal at the intersection. • Provide eastbound left-turn from Monsignor O'Brien Highway to Water Street • Allow right-turns only from Water Street. • Provide crosswalks along all legs of the intersection • Provide signal phasing to include protected walk phase to east of Water Street.
		9. *First St. Extension:* • Extend First Street across Monsignor O'Brien Highway with traffic signalization. • Prohibit left-turns from Monsignor O'Brien Highway in both directions. • Prohibit left-turns from southbound First Street extension. • Provide crosswalks along all legs of intersection. • Provide signal phasing to include protected walk phase to east of First Street Extension.

Objective	Strategy	Recommendations
		10. *East Street:* • Relocate East Street to align with Cambridge Street. • Prohibit through movements between East Street and Cambridge Street, unless warranted by development in the future. • Provide consolidated/shortened crosswalks in conjunction with relocation of East Street • Provide signal phasing to include protected walk phase to west of East Street.
		11. Additional right-turns in/right-turns out access from North Point to Monsignor O'Brien street can be incorporated if required, subject to satisfying roadway design considerations.
		12. Provide a continuous internal roadway connection from Water Street to Museum Way to facilitate flexibility of access.
	Strengthen pedestrian connections between the existing residential neighborhoods, North Point and the Green Line Lechmere station by providing enhanced crossing facilities across Monsignor O'Brien Highway.	**13.** Incorporate at least 4 new crosswalks across Monsignor O'Brien Highway, spaced no more than 300 feet apart, as included in **Rec. 6**.
		14. Traffic progression along Monsignor O'Brien Highway should be maintained through coordination of new traffic signal phasing with maximum 120-second cycle length at existing intersections. However, development proposals should analyze the opportunity of running one or more intersections at a shorter cycle length to reduce pedestrian delay.
	Increase transit accessibility to North Point.	**15.** Preserve options for on-going and future transit initiatives, including the Urban Ring Phases 1, 2 & 3, and the Green Line extension to West Medford.
		16. Seek opportunities for the early implementation of sections or parts of such transit projects, as part of new development. Refer to examples under Rec. 4, which include Transportation Demand management measures and infrastructure improvements.

Objective	Strategy	Recommendations
Enhance **access to new development at the Volpe Site**, while minimizing its traffic impacts to the residential neighborhoods.	Establish principles and guidelines for roadway access.	**17.** Primary, all-directional access to the Volpe site should be focused on Broadway and the southern section of Third Street.
		18. Maintain the integrity of the median on Binney Street to preclude new openings that might connect with neighborhood streets. This allows only for eastbound right-in/right-out on the Binney Street frontage.
	Strengthen pedestrian connections between the residential neighborhoods and the Volpe site/Kendall Square.	**19.** Provide a pedestrian crossing across Binney Street at Sixth Street to the multi-use path west of Volpe Site (refer to **Rec.40**). Experimental improvement is currently being pursued in relation to the Biogen and 300 Bent Street development
		20. The need for a crosswalk on Binney Street at Fifth Street should be investigated as the Volpe site develops.
		21. The revised configuration of the Binney Street/Fulkerson Street intersection (refer to **Rec. 27**) should include a protected crosswalk on Binney Street.
	Increase transit accessibility to Volpe site.	**22.** Preserve options for on-going and future transit initiatives, including the Urban Ring Phases 1, 2 & 3.
		23. Seek opportunities for the early implementation of sections or parts of such transit projects, as part of new development. Refer to examples under Rec. 4, which include Transportation Demand management measures and infrastructure improvements.
Enhance **access to new development in the Transition Areas**, while minimizing its traffic impact on the residential neighborhoods.	Establish principles and guidelines for roadway access.	**24.** Focus vehicular access in Transition Areas on First Street and Binney Street corridors.
		25. Locate driveway access for development west of Fulkerson on Little Binney Street, provided it does not conflict with nearby intersection.
	Focus non-residential traffic to the transition area on Bent Street by providing for two-way traffic.	**26.** Make Bent Street two-way between Third Street and Fulkerson Street. A potential subsequent stage to convert Charles Street to one-way westbound should be considered only when the effects of the initial change have been established.
	Facilitate two-way connection between Linskey Way and First Street.	Refer to **Rec. 6**.

Objective	Strategy	Recommendations
Reduce **use of neighborhood streets** by auto traffic accessing development in Kendall Square and adjacent areas.	Reduce the use of the Twin City mall parking lot as a through connection between Gore Street and Monsignor O'Brien Highway.	**27.** Eliminate direct connection via Rufo Road. Planned renovation of Twin Cities mall provides opportunity to implement.
	Reduce use of Fulkerson Street and Charles Street as an egress route from the garage on Little Binney Street without shifting traffic to other residential streets.	**28.** Implement a community process to develop design options and implementation of changes to the Fulkerson Street/Binney Street/Little Binney Street intersection layout and its traffic operation. This process is to be facilitated by Amgen (Refer also to pedestrian needs under **Rec. 21**).
Reduce **traffic speed and improve safety** and quality-of-life within the residential neighborhoods.	Traffic calming - the physical redesign of roadways to reduce traffic speeds and balance the needs of all users through safety enhancements.	**29**. Pursue traffic calming initiatives in accordance with current City criteria and procedures, which include: • Traffic speed • Location of schools • Location of playgrounds • Coordination with other City projects Streets that satisfy one or more the above-mentioned criteria for inclusion in the Citywide Traffic Calming program are: • Sixth Street • Fulkerson Street • Willow Street • Windsor Street • Gore Street • Spring Street • Charles Street • Card. Medeiros Avenue
Reduce impact of truck traffic on residential neighborhood streets.	Restrict truck routes within study area, in coordination with truck plan for the City.	**30.** Impose 24-hour ban on truck traffic on Cardinal Medeiros Avenue and Warren Street.
		31. Restrict truck hours to between 11PM and 6AM on other streets.
		32. Sign truck routes in the study area.

Objective	Strategy	Recommendations
C. ENHANCING NON-AUTO MOBILITY		
Maximize system-wide **transit accessibility** in the study area.	Support planned public transit infrastructure projects.	Refer to **Rec. 15, 16, 22 and 23**.
Provide additional **transit service, routes and connections** with regional MBTA network.	Extend additional Green Line branch service to Lechmere.	**33**. Encourage MBTA to explore improved service through extension of B and C lines from Government Center to Lechmere.
	Enhance mobility through local bus and shuttle service improvements.	**34**. Encourage MBTA to pursue local bus service improvements in association with and in response to new development. The MBTA Annual Service Plan Review provides a process for public input.
		35. Encourage expansion of private shuttle service in association with new development
		36. The Charles River TMA should continue to expand its role in providing coordinated shuttle services.
		37. Improve bus stop amenities such as shelters, seats, schedule and stop information.
	Enhance transit service through reduction of circuitous circulation for buses and shuttles.	**38**. Provide a direct, transit-and bicycle only connection from Third Street to Main Street. Pursue design including the feasibility of at least a one-way, and possibly a two-way, connection.
Improve **pedestrian and bicycle mobility.**	Develop stronger linkages between the neighborhoods and the Kendall Square area.	**39**. Improve pedestrian facilities at intersections along Binney Street/Galileo Way by providing protected pedestrian phases, shortening crosswalks, or signalizing pedestrian crosswalks.
		40. Implement required special permit mitigation projects, which include: • Galileo Way/Vassar Street/Main Street (MIT, 2000) • Broadway/Galileo Way (Tech Square, 1999/Cambridge Research Park, 1999) • Broadway/Hampshire Street (Tech Square, 1999) • Sixth Street/Binney Street (Biogen, 1999/300 Bent, 2000). See Rec. 19 • Third Street/Binney Street (Tech Square, 1999 /Amgen, 1999 /Cambridge Research Park, 1999 /Biogen, 1999 / Beal, 1999)

Objective	Strategy	Recommendations
		• Second Street/Binney Street (Cambridge Research Park, 1999 / Beal, 1999) • Binney/Fulkerson/Galileo (Amgen, 1999 / 300 Bent, 2000) • Cardinal Mediros Avenue/Little Binney Street (Amgen, 2000)
	District Commission (MDC) and will require their approval.	**51.** Signalize existing crosswalk at northbound Land Boulevard, and relocate and signalize existing crosswalk across southbound Land Boulevard to align with the proposed Broadway Canal path.
		52. Investigate the possibility of using bicycle-friendly pathway surfacing materials along the Lechmere Canal. (Improvements along the Lechmere Canal will require coordination with the Lechmere Canal Committee.)
	Provide safe crossings of Memorial Drive	**53.** Provide additional signalized crosswalk across Memorial Drive at Wadsworth Street. This is currently being planned, and will be implemented by MIT.
		54. Investigate the possibility of providing better north- and southbound connections at Third/Broadway/Main Street
	Enhance pedestrian environment on First Street.	**55.** Operate First Street/ Thorndike Street signal to bring up pedestrian phase, when called, at the end of current phase.
		56 Provide additional crosswalk at Otis Street
Provide safe and convenient pedestrian and bicycle connections across Monsignor O'Brien highway, to the Future MDC Park.	Enhance pedestrian and bicycle facilities along the Paul Dudley White path to connect to North Point Park.	**57.** Provide a multi-use bridge across North Point inlet to North Point Park. This is a part of the New Charles River Basin project coordinated by MDC and CA/T.
		58. Provide signalized crosswalk across Monsignor O'Brien Highway in front of Museum of Science to connect to the proposed multi-use bridge across North Point Inlet. This is a part of the New Charles River Basin project coordinated by MDC and CA/T.
		59. Provide a multi-use path connection along the south side of Monsignor O'Brien Highway from the MDC Stables to the signalized crosswalk at the Museum of Science. This will require coordination with MDC and the Museum of Science

Objective	Strategy	Recommendations
		60. Provide a multi-use path across the mouth of the Lechmere canal. This will provide a seamless connection from the Paul Dudley White Path to North Point Park. This will require coordination with MDC and the Museum of Science
		61. Provide a multi-use connection along the southern edge of the Museum of Science. Plans are currently being explored by the MDC.

Appendix G

Summary of Intersection Operations and Volume Data

(1998 Conditions)

Street 1	Street 2	Street 3	Intersection Type	Vehicular Level of Service		Pedestrian Volumes		Bicycle Volumes				Planned Improvements
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour		PM Peak Hour		
								Winter	Summer	Winter	Summer	
SIGNALIZED INTERSECTIONS [1]												
Broadway Street	Galileo Way		S	C	C	529	596	48	-	38	-	Yes
Broadway Street	Mid-Block Connector		S	C	C	505	533	21	-	45	-	Yes
Cambridge Street	First Street		S	C	C	615	711	6	-	10	-	Yes
Cambridge Street	Mon. O'Brien Highway		S	C	D	-	-	-	-	-	-	Yes
Cambridge Street	Second Street		S	C	D	426	323	11		8		Yes
Cambridge Street	Third Street		S	C	D	338	274	10		12		Yes
Cardinal Medeiros Ave.	Hampshire Street		S	C	C	196	232	46	150	53	131	Yes
First Street	Binney Street		S	C	B	126	125	8	-	15	-	Yes
First Street	Cambridgeside Place	Charles Street	S	B	B	85	187	6		8		
Land Boulevard	Binney Street		S	C	C	25	44	8		6		Yes
Land Boulevard	Cambridgeside Place		S	C	C	89	229	8		3		Yes
Land Boulevard	Mon. O'Brien Highway		S	F	F	110	140	79		53		
Main Street	Midblock Connector	Ames Street	S	B	C	194	377	25		24		Yes
Main Street	Portland Street		S	C	B	229	227	44	84	46	90	Yes
Portland Street	Broadway Street		S	C	F	275	196	35	92	25	112	Yes
Third Street	Binney Street		S	B	C	132	176	3	-	10	-	Yes
Third Street	Broadway Street		S	C	F	962	559	11	-	23	-	Yes
Third Street	Mon. O'Brien Highway		S	B	F	-	-	-	-	-	-	Yes
Vassar Street	Main Street	Galileo Way	S	D	D	440	640	39	-	52	-	Yes
Windsor Street	Broadway Street		S	C	C	111	151	-	67	-	96	Yes

Source: City of Cambridge

Street 1	Street 2	Street 3	Intersection Type	Vehicular Level of Service		Pedestrian Volumes		Bicycle Volumes				Planned Improvements
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour		PM Peak Hour		
								Winter	Summer	Winter	Summer	
UNSIGNALIZED INTERSECTIONS[1]												
Binney Street	Kendall Square Cinema/Garage[2]		U	-	-	435	600					Yes
Bent Street	Third Street		U	A	A	-	-					
Broadway Street	Hampshire Street		U	F	F	88	75	58	118	48	143	Yes
Cambridge Street	Cardinal Medeiros Ave.	Warren Street	U	F	F	170	138	24	-	33	-	Yes
Cambridge Street	Lambert Street	Fulkerson St.	U	F	F	135	214	26	-	41	-	Yes
Cambridge Street	Sixth Street		U	B	B	134	214	6		4		
Cardinal Medeiros Ave.	Bristol Street	Binney Street	U	C	C	65	100	15		16		Yes
Fulkerson Street	Binney Street		U	C	C	46	82	9		13		Yes
Harvard Street	Moore Street		U	A	A	163	168		61		61	
Harvard Street	Portland Street		U	C	C	69	71		56		133	
Land Boulevard	Main Street		U	A	A	-	-	-	-	-	-	
Main Street	Memorial Drive		U	A	C	-	-	-	-	-	-	
Market Street	Moore Street	Broadway	U	C	C	137	105	-	44	-	68	
Second Street	Binney Street		U	E	E	65	64	5	-	9	-	Yes
Second Street	Linskey Way		U	B	B	150	156	8	-	5	-	
Sixth Street	Bent Street		U	A	A	102	64	23	-	19	-	
Sixth Street	Binney Street		U	A	A	41	35	3	-	3	-	Yes
Sixth Street	Charles Street		U	B	B	53	33	4	-	3	-	
Sixth Street	Rogers Street		U	A	A	134	111	20	-	21	-	
Third Street	Linskey Way	Munroe Street	U	C	C	217	213	16	-	16	-	

Notes:

1. Information presented only for intersections where data are available
2. Mid-block crossing to One Kendall Square - Garage/Cinema

S=signalized, U=unsignalized

Source: City of Cambridge

SUBWAY

Line	Station	Headway (mins.)			Boarding Counts		
		Rush	Day	Night	Daily	AM Peak	PM Peak
Green	Lechmere	3.5	5	5	10,155	461	570
Red	Kendall	4	6	6	22,512	1,056	945

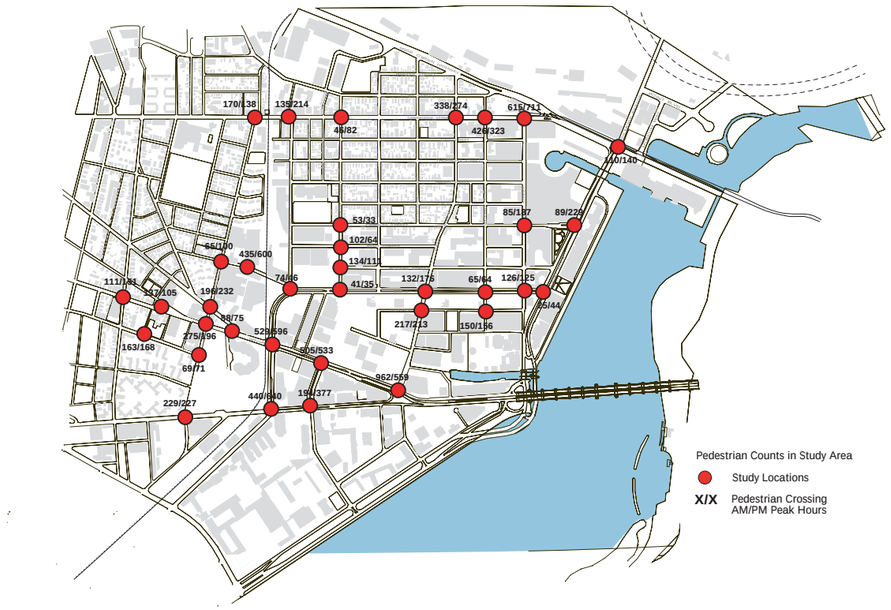
BUSES

Route	Destination	Headway (mins.)					Peak Period Capacity (One-way)	Peak Direction Ridership	
		Rush	Day	Night	Sat	Sun		Morning Peak Hour	Evening Peak Hour
Lechmere Station									
69	Harvard Square via Cambridge Street	17	23	30	20	30	198	116	191
80	Arlington Center via Highland	15	35	60	35	60	224	168	152
87	Arlington Center via Elm	16	30	30	24	30	210	180	288
88	Clarendon Hill via Highland	15	30	30	24	30	224	160	184
Kendall Station									
CT2	Ruggles via Vassar/BU	20	30	-	-	-	168	76	60
64	Oak Square via Central (during rush hours)	18	-	-	-	-	187	114	85
68	Harvard Square via Broadway Street	40	40	-	-	-	84	20	8
85	Spring Hill via Union Square	40	40	-	-	-	84	107	82

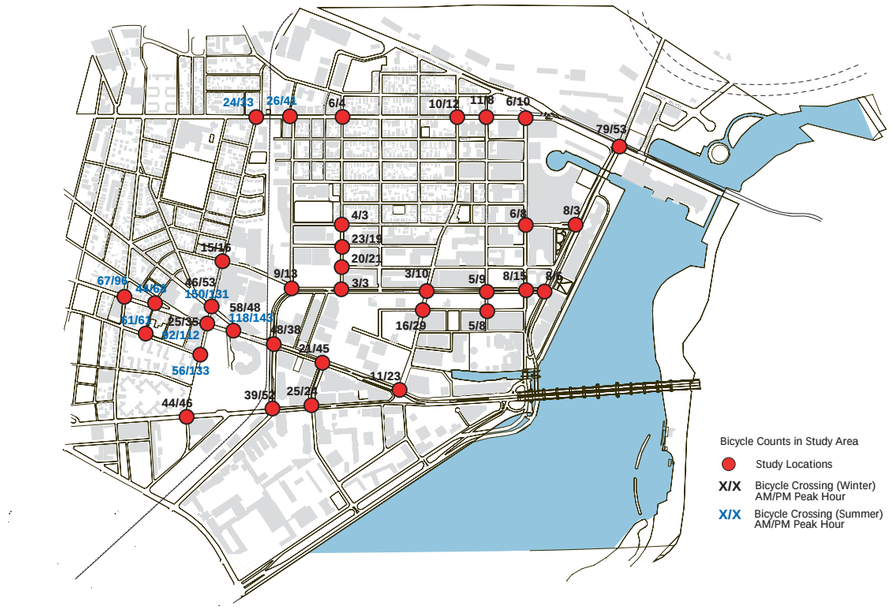
Source: Ridechecks conducted by CTPS for the MBTA, Fall 1997-Fall 98.

Appendix H

Pedestrian and Bicycle Data



Pedestrian Counts in Study Area



Bicycle Counts in Study Area